



Two NASA Earth Science Technology Projects team up to participate in the “Great Southern California ShakeOut”

Two technology projects funded by the NASA Earth Science Technology Office (ESTO) teamed up to participate in the 2008 Great Southern California ShakeOut. The event, organized by a group of non-profit, business, government and education partners within the Earthquake Country Alliance (www.earthquakecountryinfo.com), was held at 10 am on November 13, 2008 and millions of people throughout Southern California participated in what has been called the largest earthquake preparedness drill in U.S. history.

Based upon a potential magnitude 7.8 earthquake on the southern San Andreas Fault—approximately 5,000 times larger than the magnitude 5.4 earthquake that shook southern California on July 29 – the ShakeOut scenario was designed to study the likely consequences of such an event in detail as well as to test the capability of disaster responders, the scientific community, and the general population to respond.

ESTO's QuakeSim project has been working on ways to extend our ability to forecast earthquakes for several years. The QuakeSim team at the Jet Propulsion Lab combines various high-performance computing and modeling techniques with direct measurements of the Earth's crust to advance the study of fundamental earthquake processes. The project has produced a steady stream of advancements and has also seen some notable success: since 2002, a “scorecard” of earthquake predictions developed and published earlier this decade closely correlated earthquake hotspots with 22 out of 25 events (magnitude 5.0 or greater) in Southern California.

For its part in the ShakeOut drill, QuakeSim partnered with team-members from the Uninhabited Aerial Vehicle Synthetic Aperture

Radar (UAVSAR) program. UAVSAR is a new airborne instrument that uses radar to measure the Earth's surface. Currently being flown on NASA's Gulfstream-III aircraft, UAVSAR can make precise, repeat passes over an area and determine what may have changed, shifted or deformed in the intervening time using a process called repeat-pass interferometry.

While UAVSAR was not airborne during the day of the drill, the project teams laid out a detailed timeline of events as they would unfold during such an earthquake event. In the ShakeOut scenario, UAVSAR, having already taken images of much of Southern California, is scrambled into the air for new images immediately following the earthquake. The data is processed and fed into QuakeSim models, which produce complete images and visualizations of the earthquake that can show ground deformation, pinpoint areas hardest hit and help identify potential locations for large aftershocks.

As UAVSAR evolves into a full-time platform for science measurements, it is expected that this kind of rich information could be delivered to emergency responders within a few days, well within the timeframe needed to enhance a response. A short movie depicting the response by the NASA researchers is available at the QuakeSim website: <http://quakesim.jpl.nasa.gov/>



Title clip from a movie on NASA's participation in the Great Southern California ShakeOut – full movie is available at the QuakeSim website: quakesim.jpl.nasa.gov/

For more information on emerging technologies for Earth science, visit the ESTO website at: <http://esto.nasa.gov>